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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/031,068	05/29/2002	Hans Sigrist	Q68066	6054

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EXAMINER	
CHUNDURU, SURYAPRABHA	

ART UNIT	PAPER NUMBER
1637	

DATE MAILED: 03/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

S.M.

Office Action Summary	Application No.	Applicant(s)	
	10/031,068	SIGRIST, HANS	
	Examiner	Art Unit	
	Suryaprabha Chunduru	1637	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 October 2003*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ ~~Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)~~ Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. Applicants' response to the office action and amendment filed on October 8, 2003 has been entered.

2. Claims 1-20 are pending. Claims 1-3, 5-6, and 18 are amended.

3. This application filed on May 29, 2002, is a 371 of PCT/EP00/06513 filed on July 10, 2000.

Response to Arguments

4. Applicant's response to the office action (Paper No.8) is fully considered and is found persuasive.

5. With regard to the rejections made in the previous office action under 35 USC 112, second paragraph, Applicants arguments have been fully considered and rejection is with drawn in view of the amendment.

6. With regard to the rejections made in the previous office action under 35 USC 102(b), Applicants arguments have been fully considered and rejection is moot in view of the amendment and new grounds of rejection.

New Grounds of Rejections necessitated by Amendment

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

A. Claims 1-5, 8-14, 16-17, 19 are rejected under 35 U.S.C. 102(e) as being anticipated by Yeh et al. (USPN. 6,238,866).

Yeh et al. teach a biosensor system of claim 1, with molecular amplification of a signal for detecting and analyzing a biological entity in a biotic system comprising

(a) said biological entity (analyte) (see column 6, lines 7-9, column 12, lines 36-43);

(b) said sensor (detector) having at its surface immobilized detection unit (oligonucleotide probes), which comprises a nucleotide sequence complementary to said biological entity (see column 6, lines 9-11);

(c) sensor surface is being supplied to a detection and measuring device (electronic sensors)(see column 6, lines 41-48, column 7, lines 1-7), wherein signal representative of the increase in mass (signal) via hybridization characterized by addition of monomer units by catalyzing units (column 20, lines 40-45) and forming polymeric concatenation which locally increase the mass (amount) by a chain extension inducing an amplification of the signal (see column 10, lines 4-20, column 13, lines 1-15).

With regard to claim 2, Yeh et al. disclose said signal can be measured is absorption of light wave or a fluorescence signal (see 7, lines 1-7);

With regard to claim 3-5, enzymatic catalytic units comprise transferases (see 20, lines 40-45);

With regard to claim 8, Yeh et al disclose monomer compounds include nucleotides and oligonucleotides (see column 7, lines 33-45);

With regard to claim 9-10, Yeh et al. disclose sensor surface has a waveguide (electronic optical signals) which allow optical detection of the refractive index variation (emission peak)

which is being correlated with the analysis or quantifying biochemical entity (see column 14, lines 1-15, column 7, lines 13-18);

With regard to claims 11-12, Yeh et al. disclose that the nucleotides forming detection unit are covalently linked to the surface of sensor (see column 16, lines 57-67, column 17, lines 1-9) by 3' to 5' manner (see column 17, lines 29-43);

With regard to 13, Yeh et al. disclose that the nucleotide sequence can be immobilized using a photo-immobilization by exposure to ultraviolet radiation (see column 16, lines 65-67);

With regard to claim 14, Yeh et al. disclose that the nucleotide sequence is linked to the sensor surface by a bi-functional scaffold, which is linked via a docking unit (linker) (see column 17, lines 2-9, lines 29-43);

With regard to claims 16-17, Yeh et al. disclose that the docking units include such as avidin, biotinylated oligonucleotides (see column 11, lines 49-57, column 21, lines 55-65);

With regard to claim 19, Yeh et al. disclose that a docking unit is formed by an oligonucleotide having complementary sequence to one of the branches of a dendrimer (polylinker) (see column 20, lines 29-45). Thus the disclosure of Yeh et al. meets the limitations in the instant claims.

B. Claims 1-2, 8-17, 19-20 are rejected under 35 U.S.C. 102(e) as being anticipated by Barbera-Guillem et al. (USPN. 6,261,779).

Barbera-Guillem et al. teach a biosensor system of claim1, with molecular amplification of a signal for detecting and analyzing a biological entity in a biotic system comprising

(a) said biological entity (target molecule) (see column 2, lines 20-21);

(b) said sensor having at its surface immobilized detection unit, which comprises a nucleotide sequence complementary to said biological entity (see column 2, lines 22-37, column 3, lines 5-11, column 14, lines 13-67);

(c) sensor surface is being supplied to a detection and measuring device (see column 9, lines 11-21, column 10, lines 3-17), wherein signal representative of the increase in mass via hybridization characterized by addition of monomer units by catalyzing units (see column 15, lines 24-31) and forming polymeric concatenation which locally increase the mass (amount) by a chain extension inducing an amplification of the signal (see column 2, lines 25-46, column 9, lines 46-67, column 10, lines 1-2, column 21, lines 32-55).

With regard to claim 2, Barbera-Guillem et al. disclose said signal can be measured is absorption of light wave or a fluorescence signal (see column 10, lines 6-17);

With regard to claim 8, Barbera-Guillem et al. disclose that the monomer compounds include nucleotides and oligonucleotides (see column 14, lines 19-48);

With regard to claim 9-10, Barbera-Guillem et al. disclose sensor surface has a waveguide (quantum dots) which allow optical detection of the refractive index variation (emission peak) which is being correlated with the analysis or quantifying) biochemical entity (see column 21, lines 45-67);

With regard to claims 11-12, Barbera-Guillem et al. disclose that the nucleotides forming detection unit are covalently linked to the surface of sensor (functionalized nanocrystals) by base pairing (3' to 5' manner) (see column 7, lines 1-4);

With regard to 13, Barbera-Guillem et al. disclose that the nucleotide sequence can be immobilized using a photo-immobilization (see column 6, lines 38-54);

With regard to claim 14, Barbera-Guillem et al. disclose that the nucleotide sequence is linked to the sensor surface by a bi-functional scaffold, which is linked via a docking unit (linker) (see column 6, lines 1-34);

With regard to claims 15, 20, Barbera-Guillem et al. disclose that the bi-functional scaffold includes DNA dendrimers, bifunctional molecular entities (heterobifunctional photo-reactive linkers), nanocrystals (see column 6, lines 34-67);

With regard to claims 16-17, Barbera-Guillem et al. disclose that the docking units include immunoglobins (antibodies) such as avidin, biotinylated oligonucleotides (see column 18, lines 19-43);

With regard to claim 19, Barbera-Guillem et al. disclose that a docking unit is formed by an oligonucleotide having complementary sequence to one of the branches of a dendrimer (see column 6, lines 63-67, column 7, lines 1-4). Thus the disclosure of Barbera-Guillem et al. meets the limitations in the instant claims.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

A. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yeh et al. (USPN. 6,238,866) in view of Grandi et al. (USPN. 5,795,738).

Yeh et al. teach a biosensor system or device of claim 6, with molecular amplification of a signal for detecting and analyzing a biological entity in a biotic system comprising

(a) said biological entity (analyte) (see column 6, lines 7-9, column 12, lines 36-43);

(b) said sensor (detector) having at its surface immobilized detection unit (oligonucleotide probes), which comprises a nucleotide sequence complementary to said biological entity (see column 6, lines 9-11);

(c) sensor surface is being supplied to a detection and measuring device (electronic sensors)(see column 6, lines 41-48, column 7, lines 1-7), wherein signal representative of the increase in mass (signal) via hybridization characterized by addition of monomer units by catalyzing units (column 20, lines 40-45) and forming polymeric concatenation which locally increase the mass (amount) by a chain extension inducing an amplification of the signal (see column 10, lines 4-20, column 13, lines 1-15).

Yeh et al. also disclose that the system or device includes immobilization of biological entities such as proteins, enzymes, and nucleic acids on different solid supports containing -COOH, -NH2, -OH, -SH and any other suitable functional chemical groups (see column 7, lines 19-32).

However, Yeh et al. did not teach immobilization of peptide or protein using peptide sythetase.

Grandi et al. teach enzymatic synthesis of peptides using peptide synthetases, which can be immobilized on a solid support of continual use (see column 4, lines 29-33).

Therefore, it would have been prima facie obvious to a person of ordinary skill in the art at the time the invention was made, to combine a biosensor system or device as taught by Yeh et al. with the enzymatic synthesis of peptides as taught by Grandi et al. to achieve expected advantage of developing an improved biosensor applicable to a wide range of biological entities

because Grandi et al. taught that use of peptide synthetases yield high quantities of peptides having correct activity (see column 2, lines 47-57). An ordinary practitioner would have been motivated to combine the device of Yeh et al. with the enzymatic synthesis as taught by Grandi et al. to improve the utility of the biosensor to cover wide range of biological entities such as peptides which could be incorporated with a high quantities into a biosensor using enzymatic synthesis.

B. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yeh et al. (USPN. 6,238,866) in view of Hoersch et al. (USPN. 6,406,894).

Yeh et al. teach a biosensor system or device of claim 6, with molecular amplification of a signal for detecting and analyzing a biological entity in a biotic system comprising

(a) said biological entity (analyte) (see column 6, lines 7-9, column 12, lines 36-43);

(b) said sensor (detector) having at its surface immobilized detection unit (oligonucleotide probes), which comprises a nucleotide sequence complementary to said biological entity (see column 6, lines 9-11);

(c) sensor surface is being supplied to a detection and measuring device (electronic sensors)(see column 6, lines 41-48, column 7, lines 1-7), wherein signal representative of the increase in mass (signal) via hybridization characterized by addition of monomer units by catalyzing units (column 20, lines 40-45) and forming polymeric concatenation which locally increase the mass (amount) by a chain extension inducing an amplification of the signal (see column 10, lines 4-20, column 13, lines 1-15).

Yeh et al. also disclose that the system or device includes immobilization of biological entities such as proteins, enzymes, and nucleic acids on different solid supports containing -

COOH, -NH2, -OH, -SH and any other suitable functional chemical groups (see column 7, lines 19-32).

However, Yeh et al. did not teach immobilization of oligo-saccharide by sequential addition of oligo-saccharide transferse.

Hoersch et al. teach enzymatic synthesis of oligosccharides on a solid support (polymer) using nucleotide-activated carbohydrates as donors and glcosyltransferases as enzymes (see column 9, lines 28-35, column 7, lines 1-16).

Therefore, it would have been prima facie obvious to a person of ordinary skill in the art at the time the invention was made, to combine a biosensor system or device as taught by Yeh et al. with the enzymatic synthesis of oligosaccharides as taught by Hoersch et al. to achieve expected advantage of developing an improved biosensor applicable to a wide range of biological entities because Hoersch et al. taught that enzymatic glycosylation reactions could be done directly on a polymer and the yields of the glycosylation reaction are greatly improved in comparison with the yields of known processes and the loading densities of oligosccharides are also greatly increased over those achieved in the prior art (see column 6, lines 52-60). An ordinary practitioner would have been motivated to combine the device of Yeh et al. with the enzymatic synthesis of Hoersch et al. to improve the utility of the biosensor to cover wide range of biological entities such as oligosaccharides, which could be incorporated with a high loading density into a biosensor using enzymatic synthesis.

Conclusion

No claims are allowable.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Suryaprabha Chunduru whose telephone number is 571-272-0783. The examiner can normally be reached on 8.30A.M. - 4.30P.M, Mon - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gary Benzion can be reached on 571-272-0782. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9306 for regular communications and - for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0196.

Suryaprabha Chunduru
March 10, 2004

KENNETH R. HORLICK, PH.D
PRIMARY EXAMINER
3/11/04